State Rest Area Recycling Programs

A Study Report Submitted to the

Executive Office of Environmental Affairs (EOEA)
Massachusetts Highway Department (MassHighway)

Catherine Attardo
Shawei Chen
Alice Napoleon

Dec. 7, 2001

Executive Summary

At the request of the Executive Office of Environmental Affairs (EOEA) and the Massachusetts Highway Department (MassHighway), students from Center of Public Policy and Administration of University of Massachusetts, Amherst, conducted an exploratory study on rest area recycling programs. The purpose of the study is to evaluate current practices in other state rest area recycling programs in terms of program design, educational efforts, data collection and program feasibility, and other aspects.

From September to November 2001, we conducted intensive e-mail contacts and telephone calls to find states that had defunct, active or planned rest area recycling programs. Of the six states that met these characteristics, we selected California, Ohio and Wisconsin for in-depth case studies.

Based on major findings from the case studies, taking into account of the situation in Massachusetts, we recommend that Massachusetts implement a rest area recycling program. Pilot program could be considered first to gain some experience. Also, recognizing the major barriers experienced in other states, namely contamination in the receptacles caused by mixture of recyclables with wastes and illegal dumpling, people's resistance to change their behavior to recycle, vandalism and theft of receptacles, scavenging of recyclables, difficulties in data collection, lack of funding to sustain the program, etc, some specific recommendations are proposed as follows.

- ***Clear and Proper Signage***. Signs should be put along highway and at rest areas to improve public awareness and reduce contamination.
- ***Appropriate layout***. Placing receptacles where people tend to throw out most recyclables is important for achieving a high recovery rate. Placing recycling barrels in a semi-circle behind the trash can reduces contamination over placing all containers in a strait line parallel to the sidewalk.
- ***Signage and Receptacle Design.*** Effective signage could help raise public awareness and reduce the contamination of recyclables. Recommendations include using proper signage to specify what kinds of materials are accepted, clearly identify recycling receptacles, and make the program visible to the public both in rest areas and on the highway. In addition, receptacle and/or sign colors should be consistent with popular practice in local recycling programs to increase recognizability. Finally both trash and recycling containers should be clearly labeled on all sides and on their tops.
- ***Educational efforts.*** Making the traveling public aware of the importance of recycling is vital to the success of any rest area program. To this end, an extensive educational campaign accompanying the recycling program is strongly recommended. Educational efforts include using promotional advertising techniques, putting recycled objects, distributing stickers, and bumper stickers, and sending out flyers, leaflets and/or brochures.

- ***Data collection.*** It is important to keep record of the data about the type an amount of the recycled materials from the rest area, and the public participation and evaluation of the program. Three approaches are recommended for data collection. The first one is to ask the contractors to report the type and amount of recycled materials collected. The second one is to conduct visitor surveys. The last is waste characteristics studies helping to target materials that are most abundant and valuable to society.

TABLE OF CONTENTS

List of Tables

Introduction

Seeking to implement a more proactive and forward-thinking approach on environmental issues and hoping to take the lead on environmental protection and resource conservation, Massachusetts has developed a State Sustainability Program. Designed to target a wide range of governmental actions in order to reduce and eliminate wastes, toxins, air emissions and greenhouse gases, this program incorporates various program areas such as waste prevention and recycling, water conservation, renewable energy and many others. The state has recently released a solid waste master plan that sets a 70% waste reduction target by 2010.

Currently, MassHighway maintains more than 150 facilities including five district offices, the Boston office, the research and materials lab,the Franklin stockroom and more than 140 depots, all of which generate and collect a variety of waste streams. By implementing Facility Recycling Programs, MassHighway has tried to segregate materials collected from the state's highways into recyclable or non-recyclable categories to transport to depots for future disposal or recycling. The segregation ensures greater amounts of recycling and thus reduction in waste. In total, MassHighway recycled 76 percent of its waste stream in calendar year 2000, more than 15,000 tons.

Additionally, MassHighway has created an Adopt-A-Visibility Site (rest area) Program. It is designed to encourage environmentally conscious school, business and community groups to assist in beautifying their community by supplying volunteer resources, upgrading and maintaining high visibility areas and off ramps on State Highways. However, so far there have been no volunteers.

Public space recycling is one area in which the state can accomplish actual waste diversion, set an example for the private sector and citizens, and provide for public education about recycling. Currently, there are either minimal or no recycling activities at the public spaces managed by state agencies.

Highway rest areas are key public spaces. There are altogether 108 rest areas located in the five districts of MassHighway. Most rest areas are equipped with picnic tables, benches, sanitary facilities and phones. 10 rest areas have information centers and 29 have information boards. To date, not much effort has been made in rest area recycling. Therefore, to institute a rest area recycling program would be a potential area to divert materials from the waste stream and to promote recycling. Such a program would augment current recycling activities and further demonstrate Massachusetts' proactive stance on environmental affairs.

This report gives a detailed description of rest area recycling programs in three selected states. In order to facilitate comparisons, all case studies contain the same seven sections, namely background information/history of the program, rest area information, program design, data collection, education efforts, funding and financial aspects and program feasibility. Data, forms and figures, if any, are also provided within the text or in the Appendices.

Research Methods

To our knowledge, no other research on rest area recycling programs has been published. This study is necessarily exploratory, meaning that the subject has not been previously researched and that the results are intended to provide groundwork for formulating more specific questions in the future. Accordingly, sampling techniques needed to be adjusted to accommodate the lack of previous research. The reduced reliability and validity associated with nonprobability sampling techniques compromises our ability to generalize the findings from this research to other situations.

We obtained preliminary contacts at state transportation and environmental protection agencies using purposive sampling. Jessica LeBlanc, Recycling Manager for MassHighway, and the U.S. State and Local Governments with Sustainability Programs report, prepared by the Commonwealth of Massachusetts State Sustainability Program, provided contact names from other state governments. We also considered states with limited landfill space and redemption programs. We obtained the full sample of states using a reputational sampling technique, whereby preliminary contacts provide references to recycling personnel in other states. The use of reputational, or snowball, sampling is appropriate because of the established network of recycling professionals, as evidenced by numerous recycling email list serves, the National Recycling Coalition, and the Northeast Recycling Council.

To identify states with rest area recycling programs, we conducted telephone and/or email inquiries to state transportation and environmental protection agencies (see Appendix A for a list of preliminary screening questions). To gain access to potential respondents, we mentioned the client's name during our introduction or in initial telephone or email messages. Nevertheless, the

response rate to the initial survey was very low. The low response rate may be due to several factors: target respondents generally have very busy schedules, and a majority of states contacted did not know how to channel our information requests. After five to fifteen calls to different offices within a state government, we removed the state from our sample for further research. The cases that failed to materialize any information on rest area recycling seem to indicate either uncoordinated, sporadic, or ad hoc local, county, or district rest area recycling initiatives, or a total absence of this type of program in the state.

From our initial survey, we found six states that had defunct, active, or planned rest area recycling programs: California,[1] Illinois, Indiana, Ohio, Texas, and Wisconsin. From these six states, we selected three for in-depth case studies. These selections were based on information availability, diversity of program structure, and geographic scale. Case study research primarily involved conducting surveys and interviews with waste management coordinators, contractors, and environmental management agencies. In order to keep information consistent, we asked the same interview questions whenever possible. Because of geographic limitations, no interviews were conducted in person; most were conducted by telephone. Internet and library research supplemented the information from interviews and surveys.

1 California's program is not state-wide, so we can not conclude that recycling practices are representative of the entire state. However, given the location, size, and number of rest areas in sampled districts, the information is still useful for comparison with statewide programs.

Rest Area Recycling Programs: Case Studies

State of California, Department of Transportation Districts 1 and 2

History and Background

In 1999, the California State Legislature passed Assembly Bill AB75 (Chapter 764, Statutes of 1999). The bill added Sections 40148-42928 to the Public Resources Code. This new law requires state agencies and large state facilities to meet a waste diversion goal of 25 percent by January 1, 2002 and 50 percent by January 1, 2004. To ensure that goals will be met, the law required each state agency and large state facility to submit an integrated waste management plan (IWMP) to the California Integrated Waste Management Board (CIWMB) by July 15 of 2000. The law mandated recycling for all government agencies and large state facilities and encouraged city and county residents as a whole to recycle.[2]

In preparing these plans, state agencies and large state facilities identify waste diversion programs and calculate each program's current or potential impact on reducing disposal. The California Department of Transportation (Caltrans) has always been pro-active in terms of recycling. Various Safety Roadside Rest Area (SRRA) recycling programs are incorporated into Caltrans' plan to assist in meeting the required goals.[3] Other state recycling programs include Shop Recycling Programs targeting oil, tires, batteries, transmission fluid, and anti-freeze; Office

[2] Information from the response of Barbara Johnson, Rest Area Recycling Coordinator for District 2 of California, Nov. 8, 2001.
[3] Interview with Trevor O'Shaughnessy, AB 75 contact of CIWMB, Oct. 16, 2001.

Recycling Programs, targeting paper, aluminum, glass, plastic, phone books, and magazines; and the Yard Maintenance Program, targeting metals, aluminum, paper, plastic, and green waste.[4]

The Headquarters Resource Conservation Branch of Caltrans has the charge of IWMP implementation. However, because California is so big, this plan is difficult to manage at the state level. There are twelve Caltrans districts, and each district has a corresponding contact. According to the data provided by Rick Houston, Maintenance Manager Office of Roadsides, Caltrans Headquarters, there are a total of 88 rest areas in these districts.[5] Rest area recycling is under the purview of each district. Recycling procedures are contingent upon the location of the various districts; therefore, recycling efforts may differ from district to district.

Districts 1 and 2 are the only ones that responded to the initial survey. Both districts are located in the northern part of California and have similar recycling management practices. Although we cannot conclude that their practices are representative of the rest of California, information from these two districts is useful given their location, size, and number of rest areas.

Program Design

According to Rick Houston, Caltran has initiated its efforts in rest area recycling since 1993, but different districts may start in different years. AB75 in 1999 made the recycling mandatory and required formal data reporting. The rest area recycling program in Districts 1 and 2 started around 1998. The goals of the program are to achieve recycling goals, educate the citizens of

[4] Information from the response of Nita Brake, Highway Coordinator in District 1 of California, Nov. 27, 2001. Green wastes refer to wood products and grass which could be diverted into mulch for vegetation roadside use.
[5] There are no rest areas in District 12.

California, and reduce litter. To this end, the rest area recycling programs collect plastic, glass and aluminum cans, some paper, cardboard and green wastes.[6]

Both District 1 and 2 contract out the maintenance of rest areas to the “Sheltered Workshops" program. Sheltered Workshops are non-profit organizations funded by grants and/or other means. They provide employment training for people with disabilities, both physically and mentally. These individuals perform paid work and at the same time learn the skills necessary to obtain competitive employment in the local community. People are employed in a number of different work environments, including assembly and packaging, as part of a crew providing services in the community (such as janitorial, grounds keeping, and motel housekeeping), and through individual placement at local employers. One such organization, Shasta County Opportunity Center, provides roadside clean-up and runs the mail-room for their clients.[7] In addition, the workshop provides a variety of support services to help handicapped people secure and retain jobs.

Contracting procedures differ between districts. In District 1, there are only two organizations that do the maintenance work: Redwoods United and Mendocino County Department of Mental Health. District 2 organized a public bidding to find the most cost-effective contractors. Under the contract, the responsibilities of the contractors include cleaning the restrooms, refilling toilet paper, watering the grass, and cleaning the yard, as well as taking care of the recycling.[8] In addition to the cost of maintenance contracts, Caltrans is responsible for purchasing the

[6] Interview with Trevor O’Shaughnessy, AB 75 contact of CIWMB, Oct. 16, 2001. Green wastes refer to wood products and grass, which could be diverted into mulch for vegetation roadside use.
[7] For more information, please see <www.oppcenter.org>.
[8] Interview with Nita Brake, Highway Coordinator in District 1, California, Nov. 29, 2001.

receptacles and placing them in the rest areas. Typically, the Districts installed three receptacles per rest area.

The frequency of pick-up varies between rest areas, depending on the amount of waste generated. Usually the contractors clean the rest areas three to four times per week, seven days a week when the rest area is open. They also empty the dumpsters and collect recycled materials. Because the public occasionally drops recyclable materials in with wastes, contractors have to sort them out from the dumpsters.

There are no signs along the highway, but there are signs in the rest areas to let the public know where to dispose of recyclable containers. They are put in view of the motorist. There are also labels on the receptacles indicating which kind of materials is accepted.

Description of Rest Areas

District 1

District 1 (Redwood Empire North Coast) headquarters office is located in the city of Eureka, Humboldt County, California. Many remote offices for both construction and maintenance activities are located throughout the district, which includes the counties of Del Norte, Humboldt, Lake, and Mendocino.

The North Coast depends on District 1's highway infrastructure for both commerce and tourism. Route 101, traversing north to south through the heart of the district, is often characterized as the

"lifeline of the North Coast."[9] District 1 is in charge of maintaining that route and the highway system generally.

District 1 has seven rest areas, most of which are located along Route 101.[10] They all have facilities such as restrooms and picnic tables. Most of them also have telephones. One rest area has a trailer sanitation station. None of the rest areas have vending machines. All are handicapped accessible. No information is available on traffic flow.

According to Nita Brake, Highway Coordinator for District 1, currently there are recycling programs in place at six out of the seven rest areas in District 1. Originally, District 1 planned to offer recycling at all rest areas. Receptacles were installed in all seven areas. However, because some of the rest areas are small and located in remote areas, it was hard for the administration to keep track of recycling collections and to police these areas to prevent scavenging and vandalism. The Moss Cove rest area in Mendocino County no longer has recycling services. After replacing stolen or broken receptacles three times, District 1 decided to give up the recycling effort there.[11] All the rest areas have been maintained by the "Sheltered Workshops" program.

District 2

District 2 was founded in 1911 and is one of the original seven division offices within Caltrans. Headquartered in Redding, District 2 encompasses more than 27,000 square miles and nine counties. The seven northeastern counties are located within the district's boundaries, which include Lassen, Modoc, Plumas, Shasta, Siskiyou, Tehama and Trinity. District 2 also

[9] For more information, please see <http://www.dot.ca.gov/dist1/>.
[10] See Appendix C for a map of rest area locations in northern California.
[11] Interview with Nita Brake, Nov. 29, 2001.

encompasses portions of Butte and Sierra counties. Most of these counties are located in remote areas and are small in size and population. By any means, this district is not a rural area.

District 2 is responsible for coordinating the operations and maintenance of 1,750 center line miles of the Highway system, comprised of 22 separate routes. Of the total mileage, only about 200 miles are divided highway/freeway; the remainder is two-lane roads serving rural and mountain regions that make up the largest part of District 2's geographic area.[12] The rest areas are located along these various routes. Most of them are in remote locations, with the exception of those along the I-5 corridor (Interstate 5).

There are a total of nineteen Safety Roadside Rest Areas located strategically throughout the various counties in District 2. Among them, only ten are open year-round. The others are closed down in snowy seasons. All of the rest areas have facilities like restrooms, picnic tables, and water supply. Most of them have phones. Five out of the nineteen have vending machines, and only one has a trailer sanitation station. All are handicapped accessible.

With the exception of seven locations, contractors in the private sector currently maintain all rest areas. These seven are maintained by "Sheltered Workshops" program. Like District 1, District 2 intended to have receptacles in all rest areas, but recycling bins placed in some remote areas have been vandalized. At this time, it is not cost effective to replace bins in those areas. The contractor has agreed to separate plastic, aluminum, glass, and cardboard from the dumpster for recycling to the best of his/her ability. However, the State is not currently tracking collections at these SRRA's.[13]

[12] For more information, please see <http://www.dot.ca.gov/dist2/>.
[13] Response from Barbara Johnson, Dec. 4, 2001.

Data Collection

The contractors are required under contract to provide information on the quantity and content of recycled materials on the "Recycling Data Report," Form SRPS 5. Some contractors forward this form each month with their monthly billing; others submit it on a quarterly basis.[14] Each contractor is asked to document the types and amounts of materials recycled and/or diverted from the landfill on this form. The District's recycling coordinator incorporates all of this information into the District's Recycle Plan. Although the recycling programs have been in effect for more than two years, reporting (quantitative measurement) has just begun. One difficulty is to get the forms back on time. The Districts are still trying to find out the best way to track recycling data, and hence do not yet have a complete record.

Educational Efforts

There is an educational campaign accompanying California's overall recycling efforts, but little to promote rest area recycling specifically. IWMB provides training in various locations on a yearly basis for government agencies such as Caltrans. Training usually focuses on the use of conversion formulas and the proper completion of the annually updated recycling spreadsheet, as well as the importance of diverting garbage from landfills. IWMB also provides brochures and posters made from recycled material. The districts can post these promotional materials throughout their facilities and also hand them out to the general public when appropriate.[15]

The Districts also make an effort to educate the public on the importance of recycling. They promote recycling by way of community presentations, school assemblies, and also posted

[14] Interview with Barbara Johnson, recycling coordinator in District 2, California, Nov. 8, 2001.
[15] Interview with Trvor O'Shuanghnessy, Oct. 16, 2001.

information in rest area kiosk displays. In addition, they make requests for community volunteers (from the Adopt-A-Highway program) to recycle the trash they find on the roadsides.[16]

One point worth noting is that the recycling coordinators think public awareness of recycling is already quite high in California, primarily due to state education efforts. Information on how to recycle is readily available to the public. There are even advertisements encouraging recycling in utility bills. Therefore, no special emphasis was put on education in implementing the rest area recycling program. Trusting that the public will recycle if given the means, the Districts are largely concerned with providing the receptacles and labeling them.[17]

Funding and Financial Data

Although Districts 1 and 2 have not done a comprehensive cost-benefit analysis of their recycling programs, some information obtained from interviewing the recycling coordinators is useful.

There is no direct funding allocated from the state level. Each district gets some funding from its own budget for purchasing receptacles and paying the contractors for maintenance work. According to the recycling coordinators' estimates, labeled receptacles cost around $300 each. There are three receptacles at each site, so it would cost approximately $900 to install receptacles at each rest area.[18]

Payment to the contractors varies from rest area to rest area, depending on its size and the amount of work needed. Maintenance of a large, busy rest area (for example, those located along Interstate 5 in District 2), would cost roughly $3,000 per month. For a smaller, less busy rest area, the figure would be approximately $2,200 per month. However, these figures represent the

[16] Response from Nita Brake, Nov. 27, 2001.
[17] Interview with Barbara Johnson, Nov. 29, 2001.

cost of maintaining each rest area as a whole, not just recycling. And, as mentioned previously, not all rest areas are open year round. There are few visitors during the snowy season. As a result, it is not cost-effective to maintain the rest areas in the winter months.

Districts 1 and 2 have different policies concerning the proceeds from the sale of recycled materials. In District 2, the proceeds from recycling are deducted from its payment to contractors for their maintenance work. It is a way for the District to save costs.[19] In contrast, District 1 does not care about the revenues from recycling, because they are not significant for most rest areas. Its primary concern is that the recycling is done. District 1 lets the Sheltered Workshops keep the proceeds for a slush/party fund.[20] The revenues reward contractors for good performance and provide them with a monetary incentive to recover a high portion of recyclable materials. Unfortunately, there are no actual data available at this point about recycling revenues.

Program Results

Both Districts 1 and 2 think the program has been successful in the following ways.

- It is better to recycle one can than to recycle nothing at all. By putting receptacles at rest areas, people who want to recycle have the opportunity to do so. The program can also help the districts to achieve their recycling goals.
- Public awareness of recycling has been raised.
- Handicapped people have increased employment opportunities, allowing them to live independently. They also feel empowered to do something good.

---

[18] Interview with Nita Brake, Nov. 29, 2001.
[19] Interview with Barbara Johnson, Nov. 29, 2001.
[20] Interview with Nita Brake, Nov. 29, 2001.

- The proceeds from recycling benefit either the Sheltered Workshops or the District. In District 1, handicapped workers enjoy monetary rewards for recycling and are able to have parties and sodas with the proceeds. In District 2, the proceeds may help offset the cost of the program.

However, there is still room for improvement.

- They have faced difficulty in creating procedures for collecting recycling data and following-up with contractors to ensure submission of the required paperwork, which documents the type and the quantity of recycled materials. At this point, it is still a work in progress. However, the process continues to improve as time goes by.[21]
- They face vandalism and theft of the receptacles in remote locations, so that recycling could not be implemented in some rest areas.
- They have had difficulty dealing with some people's resistance towards recycling. Not all people throw their recyclables in the labeled bins. Rest area employees are still going through the trash to retrieve recyclables. Sometimes, people mix waste with recyclable materials, causing contamination[22].

[21] Response from Barbara Johnson, Nov. 8, 2001.
[22] Interview with Nita Brake, Nov. 29, 2001.

State of Ohio, Department of Transportation

History and Background

The recycling law in the state of Ohio requires state agencies to conduct workplace recycling activities. In addition, the state provides about 8 million dollars annually in grant funds to assist local communities establish curbside, drop off or other recycling collections.[23] In 1994, the Ohio Department of Transportation (ODOT) and the Department of Natural Resources began the state's first rest area recycling program as an awareness effort for recycling and litter prevention. The state hoped that by offering travelers an opportunity to recycle, this pilot program would remind visitors of the importance of recycling and would demonstrate the type and quality of products that could be made using the recyclables collected at the rest areas.[24]

The pilot rest area recycling locations selected were volunteered by the ODOT districts they resided in.[25] The Division of Recycling and Litter Prevention (DRLP) purchased the recycling containers, and ODOT prepared the space within the rest areas. A custodial staff was contracted to pull the collected recyclables as needed. Four of the six locations collect materials in plastic bags; two use 95 gallon plastic carts. During the six-month program, commercial recyclers were paid to pick up the recyclables collected by the custodial staff at the rest areas.[26] Only plastic and aluminum/bi-metal beverage containers were collected.

[23] Interview with Patricia Raynack, Program Assistance Manager, Ohio Department of Natural Resources, Division of Recycling and Litter Prevention, Nov. 1, 2001.
[24] Interview with Patricia Raynak, Oct. 18, 2001.
[25] Interview with Patricia Raynack, Nov. 1, 2001.
[26] Interview with Patricia Raynak, Oct. 18, 2001.

Ohio investigated other state recycling programs extensively in 1994, looking for a model. Information collected about Wisconsin's rest area recycling helped develop the 1994 program. The current Ohio rest area recycling activities are based upon the previous pilot.[27]

Program Design

Ohio's rest area recycling program was reinstated at six locations in 2000. It was not continued after 1995 because it was believed that many of the ODOT districts were not willing to incur any extra expenses, or efforts, that would accompany a rest area recycling program.[28] A major driving force in the rebirth of the program in 2000 was the feeling among officials that "there should be a rest area recycling program in place in major rest areas prior to and during Ohio's Bicentennial in 2003."[29] The ODOT districts again volunteered the sites, but this time around local county non-profit recycling centers near the sites were asked to pick up the collected recyclables as a community service. The state provides grant funds to offset the cost of many of these programs. In addition, a different type of recycling collection container was used in an attempt to reduce contamination.[30]

The rest area recycling program focuses on the collection of only a few materials: aluminum/Bi-metal beverage cans, plastic beverage bottles, glass containers (in 5 of 6 locations) and newspaper (in two locations). These materials were selected because they appeared to be the most likely recyclable materials that travelers would have in their cars.[31] At least one rest area (Ashland) immediately stopped collecting glass because they felt it was a safety hazard.

[27] Interview with Patricia Raynak, Oct. 18, 2001.
[28] Interview with Patricia Raynack, Oct. 29, 2001.
[29] Interview with Patricia Raynack, Oct. 29, 2001.
[30] Interview with Patricia Raynack, Oct. 29, 2001.
[31] Interview with Patricia Raynack, Oct. 29, 2001.

Newspaper was collected at two locations as an experiment. The rest area on I-97 southbound near Lebanon, Ohio collects newspaper, as does the rest area on I-97 northbound near Ashland. These two particular locations, between Columbus, Cleveland and Cincinnati, were selected because they are stops for many Ohio business trip and family outing travelers.[32]

However, the pilot is "on hold" at the present time. One particular reason is that Ohio is having severe budget cuts. Unable to provide grants, the state feels it is likely that local county recycling programs may institute a charge for picking up the recyclables.[33] In addition, ODOT does not want to pass more work onto its custodial staff by having them pull the recyclables and clean the containers without being able to increase their pay.[34]

Description of Rest Areas

The rest areas in this program are considered to be "rural" by Ohio officials.[35] They are located on major state highways, but at a distance from the nearest freeway exit. Four of the six locations have "Travelers Information Centers" (TICs). The small buildings that house these centers provide literature on Ohio attractions as well as directions. They also contain vending machines offering snacks and drinks. None of the rest areas have commercial food vendors such as McDonald's or any other "bona fide food vendors on site."[36] All of the information centers are jointly operated by ODOT and the Department of Development, which handles travel and tourism issues.

[32] Interview with Patricia Raynack, Oct. 29, 2001.
[33] Interview with Patricia Raynack, Oct. 29, 2001.
[34] Interview with Patricia Raynack, Oct. 29, 2001.
[35] Interview with Patricia Raynack, Nov. 19, 2001.
[36] Interview with Patricia Raynack, Nov. 19, 2001.

The collection containers themselves are made with recycled plastic. The signs on site are reused aluminum ODOT highway signs that have been cut in half and remanufactured as recycling center signs. In addition, there are recycled-content park benches and, in a few cases, recycled-content picnic tables designed for easy access for the handicapped. There are small signs near the recycled-content benches letting the public know that the benches were made with recycled plastic from post consumer collections.[37]

Funding and Financial Data

Beyond the initial cost of the recycling containers and the plastic bags (purchased by DRLPP), there is no cost to operate the program.[38] The collection program was established only at locations where local communities or non-profit recycling centers agreed to service the rest areas at no cost. However, additional costs are accrued when an education program is implemented. These costs include those associated with the production of brochures or other promotional intended to raise awareness.

Educational Efforts

ODOT prepared leaflets that are distributed at the Travelers Information Centers (TICs) located at four of the six pilot locations. DRLP produced a static cling decal that is also given out at the TICs and by DRLP and ODOT at various events around Ohio. No other outreach or education was undertaken because the program was a test and ODOT was uncertain as to whether it would be continued or extended.[39] There are signs above the containers (about 4' long and 2'-2.5' high).

[37] Interview with Patricia Raynack, Oct. 29, 2001.
[38] Interview with Patricia Raynack, Oct. 18, 2001.
[39] Interview with Patricia Raynack, Oct. 18, 2001.

The recycling symbol (about 30-32" square) has been placed either on the "Rest Area Ahead" sign on the highway or on the arrow sign on the entrance to the rest area.[40] Ohio believes awareness was increased as a result of the program. Having the opportunity to recycle, even though it may not be available at all rest areas in Ohio or in their home state, will remind people that recycling is important.[41] Those who have been exposed to the rest area recycling program, when traveling again, may take materials home to recycle them instead of dumping them on the highway or even in a trashcan if they cannot find an opportunity to recycle along the way.[42]

Data Collection

Visitor survey cards and exit surveys (respondents totaled 148 to date) revealed that 33% used the recycling containers, 48% noticed the signs on the rest area ahead signs or the arrow signs and 94% thought the program should be expanded to other rest areas if it could be done in a cost effective manner.[43] Reports indicate an estimated 17,866 pounds of materials was collected through August of 2001.[44] The programs collected approximately 3,352 pounds of glass during the period October 2000 through June 30, 2001.[45] From October 2000 through June 30, 2001, they recycled almost 7,000 pounds of newspaper.[46] It is difficult to determine if any reduction of litter has occurred. However, there are now plans to work more closely with ODOT and the county and local community recycling programs to reduce highway litter. ODOT uses an index to measure highway litter in areas where there is an unacceptable amount of litter. DRLP and the local programs may use rest area recycling as part of the program to bring the amount of litter

[40] Interview with Patricia Raynack, Oct. 18, 2001.
[41] Interview with Patricia Raynack, Oct. 18, 2001.
[42] Interview with Patricia Raynack, Oct. 18, 2001.
[43] Interview with Patricia Raynack, Oct. 18, 2001.
[44] Interview with Patricia Raynack, Oct. 18, 2001.
[45] Interview with Patricia Raynack, Oct. 29, 2001.

down to an acceptable level. The Division of Recycling and Litter Prevention depends on feedback from the communities regarding the status of litter within individual communities. ODOT has a roadway maintenance index, which they use to measure and prepare district reports detailing relevant roadway conditions. There is no information on waste amounts before the program or current amounts because Ohio did not expect that there would be high volumes of recyclables collected, especially during the first period of operation. There are records of the estimated amounts of recyclables collected because the custodial staff record the number of bags or containers sent to recycling centers and send DRLP reports. DLRP has developed estimates for both bags and containers filled with different materials. They record this information. Ohio believes the recyclables collected are coming from the traveling public. ODOT was concerned before the pilot that local residents might come and drop off materials into the rest area containers but has not seen any evidence of this occurring.

Program Results

The greatest difficulty Ohio's program faces is a lack of funds due to state budget cuts. The program simply can no longer operate in the face of shrinking financial resources. However, while in use, Ohio officials believe the program was successful. Success is measured primarily through the response to rest area visitor survey cards that indicated that 33% used the recycling containers, 48% noticed the signs on the rest area ahead signs or the arrow signs, and 94% thought the program should be expanded to other rest areas if it could be done in a cost effective manner.[47] Thus, a particularly successful aspect of the program was good signage to attract visitors to recycle friendly rest areas. However, a very significant weakness of the program is the

[46] Interview with Patricia Raynack, Oct. 29, 2001.

lack of data. Because the state does not have records of waste amounts before the program began, nor does it have any on current levels, it is very difficult to determine if any improvement in litter reduction has occurred due to the recycling program. All the state has to go on are estimates recorded by custodial staff, who count the number of bags they collect.

State of Wisconsin, Department of Transportation

History and Background

Wisconsin's recycling law, Act 335, was passed on May 11, 1990. The Act outlawed the placement of cardboard, office paper, newspaper, magazines, polystyrene packaging, glass, aluminum, plastic, and steel containers in landfills. [48] By requiring that 100% of these materials be recycled, the law effectively makes recycling mandatory for all persons and organizations in Wisconsin.[49] The law allowed for gradual implementation in three steps. The first two phases required that lead batteries (1991) and yard wastes (1993) be recycled. The Wisconsin Department of Transportation (WDOT) implemented a recycling program at all Interstate rest areas in 1995 in accordance with the third phase, which requires all agencies to meet a 50% waste diversion target.[50] Wisconsin's rest area recycling program was probably the first of its kind.

[47] Interview with Patricia Raynack, 10/18/01.
[48] Wisconsin Statutes. 287.07. Chapter 287. Solid Waste Reduction, Recovery, and Recycling.
[49] Although recycling is legally mandatory, it is not enforced systematically and hence becomes voluntary. Interview with Tom Martinelli, Nov. 8, 2001.
[50] Wisconsin Statutes. 16.15. 2000. Chapter 16: Department of Administration. Resource Recovery and Recycling Program.

WDOT collaborated with the Department of Natural Resources, which was in the process of designing a parks recycling program at the time, to develop the rest area recycling program.[51] WDOT also initiated an Adopt-A-Highway program, which requires volunteer groups to keep aluminum, glass, steel, and type 1 and 2 plastic containers separate from the non-recyclable solid waste obtained during litter collection.[52]

The rest area recycling program started in 1992 with a pilot program at a limited number of sites.[53] WDOT expanded it over 4 years, until all Interstate rest areas had recycling collection as of January 1, 1995.[54] WDOT's main goals in starting the program were to comply with the law (even though WDOT doesn't actually generate most of the waste at the rest areas) and to set an example for the public.[55]

Program Design

WDOT hires Rehabilitation for Wisconsin (RFW), a non-profit organization, to manage the maintenance of rest areas.[56] To this end, RFW contracts out to Community Rehabilitation Programs (CRPs) across the state. These programs provide low or minimum wage employment for their clients, largely physically and mentally disabled persons.[57] The CRPs sort through recycled materials and take them to local recycling facilities,[58] clean bins, market the materials, and report quantities collected.[59] Receptacles for most recyclables are emptied when they are ¾

[51] Interview with Tom Martinelli, Nov. 8, 2001.
[52] Recycling Economics Group. 1995. Wisconsin's Adopt-A-Highway Program, p. 1.
[53] Rehabilitation for Wisconsin. 1998. Rest Area and Wayside Recyclable Materials Report.
[54] Interview with Tom Martinelli, Nov. 8, 2001.
[55] Interview with Tom Martinelli, Nov. 8, 2001.
[56] Interview with Dave Kreger, Oct. 12, 2001.
[57] Interview with Dave Kreger, Nov. 30, 2001.
[58] See <http://www.rfw.org/ram-program.html>. Accessed Oct. 11, 2001.
[59] Rehabilitation for Wisconsin. 1998.Rest Area and Wayside Recyclable Materials Report.

full, with more frequent collection at the main clusters and of aluminum and glass.[60] As of 1998, CRPs managed recycling collection at 69 sites, with County Highway Department (CHD) crews managing another 75.

Under Wisconsin's rest area recycling program, the CRPs and CHDs collect aluminum, tin, clear plastic containers (types 1 and 2), and glass (clear, brown, and green). A majority of rest areas also have newspaper and magazine recycling.[61] Maintenance personnel are also required to recycle cardboard at some sites.[62] RFW has documented a gradual trend in recycling composition from glass to plastic. This may be due to a shift in materials used to manufacture beverage containers.

Description of Rest Areas

Wisconsin's 35 rest areas and 168 waysides, or seasonal rest areas, are mostly concentrated in the central part of the state, which is largely comprised of rural areas and small towns. Adjacent to highly populated counties, rest areas are also numerous in the southern part of the state. A large portion of these sites is along Interstates 90 and 94. The largely unpopulated northern region, marked by vast pinestral forests, is home to only a handful of rest stops.[63]

Not all waysides have recycling facilities. WDOT set up recycling receptacles at waysides receiving traffic in excess of 1000 vehicles per day. WDOT removed trash containers at sites that did not meet the minimum traffic flow requirements and also posted signs to ask rest area users

[60] Aluminum is collected more frequently to minimize loss to the CRPs from scavenging, and to generally discourage the practice. Shelter workers reduce the weight they are required to lift by collecting glass more frequently than other materials.
[61] Rehabilitation for Wisconsin. 1998.Rest Area and Wayside Recyclable Materials Report.
[62] Cardboard recycling is not available to the public (Interview with Tom Martinelli, Nov. 8, 2001).
[63] See <http://www.dot.state.wi.us>, <http://www.doa.state.wi.us>, and <http://www.travelwisconsin.com>.

to take their trash with them. WDOT has not noticed a substantial increase in litter since the trash barrels were removed from the low-use waysides.[64]

All rest areas have bathrooms, some of which have paper towel dispensers instead of hot air dryers. Vending machines are present at many of the rest areas. Not surprisingly, Recycling Economics Group reported that vending machines generated increased paper and container refuse in the 1992 Waste Characterization Study. In addition, many rest areas have picnic areas. Some waysides even feature containers made of recycled plastic lumber.[65]

The physical layout of the rest areas was designed to facilitate recycling. Near the main building, the WDOT set up receptacles in main clusters, containing trash barrels as well as a receptacle for each type of recyclable material accepted. In addition, approximately three clusters with trash, aluminum, glass, and plastic receptacles were placed near the curb. Individual sites were reviewed to determine the appropriate number of clusters and the best layout.[66] To further encourage recycling, WDOT set up signs and made brochures available at the rest areas. Signs are located at each cluster. Labels on the containers inform visitors about what types of material can be recycled.

Data Collection

WDOT does not have data on recycling efforts prior to the program's commencement. Data collection began in 1991, but it was incomplete and crude. Good record keeping on the quantity of recycled goods collected at the sites began in 1993. Initially, collection crews estimated the amount of recycling by multiplying the number of bags for each recycled material by an

[64] Interview with Tom Martinelli, Nov. 8, 2001.
[65] Interview with David Kreger, Nov. 30, 2001.

estimated coefficient. Later on, CRPs and CHDs weighed and recorded the weight of each bag to produce more accurate figures.[67] They sent this data to RFW monthly.[68] In 1996, the Council on Recycling stopped asking WDOT for recycling reports. [69] RFW ceased compiling information as of January, 1999.[70]

RFW has tracked recycling participation through public surveys, revealing a 10% increase in visitors who use the recycling containers during their visit.[71] A study showed that users of Interstate rest areas were more conscientious of placing materials in the proper containers than were users of wayside areas.[72] Trash sort studies, yielding information on diversion and recovery rates, were completed from 1992 through 1995.[73]

Educational Efforts

As a part of the recycling program, Wisconsin DOT sent out press releases and made brochures available at the rest areas (see Appendix B for a copy of the brochure). In addition, the highway broadcast channel featured messages letting travelers know about the availability of recycling at rest areas.

Wisconsin DOT set up signs at clusters to further raise public awareness. At one point, the Recycling Economics Group recommended enhancing signs with images of celebrities; however,

---

[66] Interview with Tom Martinelli, Nov. 8, 2001.
[67] Vendors purchased the scales to weigh recycled materials but were allowed to bill the cost back to DOT (Interview with Dave Kreger, Nov. 30, 2001).
[68] Rehabilitation for Wisconsin. 1998.Rest Area and Wayside Recyclable Materials Report.
[69] Interview with Tom Martinelli, Nov. 8, 2001.
[70] Rehabilitation for Wisconsin. 1998.Rest Area and Wayside Recyclable Materials Report.
[71] Rehabilitation for Wisconsin. 1998.Rest Area and Wayside Recyclable Materials Report.
[72] Disabled Workers Pick Up Waysides, Wisconsin State Journal, Mar. 22, 1995, p. 8B.
[73] The diversion rate is defined as the portion of the waste stream that is diverted away from the landfill. The recovery rate is the percentage of recyclable materials that are discarded in recycling containers.

this was never implemented. There are also no signs on the highways to let visitors know that they can recycle at rest stops.

Funding and Financial Data

Funding for the rest area recycling program comes directly out of WDOT's budget for rest area maintenance. The budget was increased over several years to allow for initial capital costs, such as signing and receptacles, and variable operational costs, such as collection and maintenance. WDOT allows the CRPs to keep revenues from the sale of recycled materials, provided that these funds are used for programs benefiting the organizations' clients (the employees who clean the rest areas).[74]

WDOT does not maintain separate cost records for its rest area recycling program. The total amount budgeted for the Rest Area Maintenance contract with RFW and the CRPs was $5.5 million in 2001. This amount covers maintenance functions for all rest areas and those waysides maintained by the CRPs.[75] WDOT does not track recycling costs separately from other rest area maintenance functions, such as cleaning and trash collection.

Program Results

DOT and its contractors experienced a number of difficulties, some of which dissipated over time:

- It took a while for the public to get used to sorting recyclable materials correctly. The problem lessened over time, perhaps as a result of the introduction of signs in the second

year of the program.[76] Contamination rates have continually declined.[77] In addition, contamination in either the aluminum or glass containers does not pose a significant problem in terms of the recycling process.[78]

- Recyclable materials that were not accepted by the recycling program formed a different type of "contamination." For example, contractors found high-numbered plastics (5 or 6) in the type 1 or 2 plastic receptacles. In a 1995 study, the Recycling Economics Group found that approximately one out of five plastic items in the plastics receptacle were unacceptable types of plastic.[79] As a result, contractors occasionally have to re-sort materials in the recycling barrels. [80]

- Glass breakage occurs if people do not set bottles into the receptacles carefully. Crews needed to wear cut-proof gloves to avoid being cut.[81] False bottoms on glass bins also help to reduce this problem.[82]

- In the beginning of the program, maintenance crews had difficulty finding markets for the recycled materials.[83] The lack of recycling markets for garbage haulers can actually lead to *negative* returns, as contractors must pay to have the recyclables taken off their hands.

---

[74] Revenues from the recycled materials are frequently insignificant, with many contractors reporting no revenue. For example, the highest sales revenue reported in 1998 for a bilateral rest area was $1446.31 (Rehabilitation for Wis., 1998 Rest Area and Wayside Recyclable Materials Report; Interview with Tom Martinelli, Nov. 8, 2001).
[75] Interview with Tom Martinelli, Dec. 6, 2001.
[76] Interview with Tom Martinelli, Nov. 8, 2001.
[77] The evidence for reduced contamination is stronger at rest area sites than at waysides (Recycling Economics Group. 1995. Rest Area Recycling Effectiveness Study, p. 2).
[78] A batch of glass or aluminum with a high percentage of contaminants will likely receive a lower price than batches with low contamination, due to weight differences. Because of the low melting temperature of plastic, contaminants pose more significant difficulties (Recycling Economics Group, p. 6)
[79] Recycling Economics Group. 1995. Rest Area Recycling Effectiveness Study, p. 18.
[80] Interview with Tom Martinelli, Nov. 8, 2001.
[81] Interview with Tom Martinelli, Nov. 8, 2001.
[82] Recycling Economics Group. 1995. Rest Area Recycling Effectiveness Study.
[83] Interview with Tom Martinelli, Nov. 8, 2001.

The monetary returns from the sale of collected material are frequently low, as a result of people scavenging the most valuable materials, the low market price for most materials, and buyers' unwillingness to pay full price for contaminated goods. However, since recycling has become more widespread, this problem has almost entirely dissipated.[84]

- Although Wisconsin does not have bottle redemption legislation, scavengers took recycled material from the receptacles to sell on the market. CRPs dealt with the pilfering by putting locks on the receptacle access doors for aluminum (receiving a market price of about $.30/lb).[85] (Alternative strategies for dealing with scavenging are discussed later in the section titled, *Recycling Programs: Other Types of Public Space*).

- Illegal dumping of residential trash is evident at some rest areas.[86] Some towns have levied a charge for recycling and trash collection as a result of Act 335, increasing the incentives to dump illegally. In addition, trash disposal at rest areas may be more convenient for some residents, especially weekend travelers. However, the incidence of dumping is sporadic.[87] There does not appear to be evidence that dumping is linked with the recycling program. To deal with illegal dumping, WDOT erected signs notifying visitors that receptacles are for travelers only. Maintenance crews also open bags that were obviously dumped, usually set apart from trash and recycling bins. WDOT and the local sheriff's department occasionally track the offenders through return addresses on discarded envelopes and issue notices to parties that were suspected of dumping.[88]

[84] Interview with Dave Kreger, Nov. 30, 2001.
[85] Interview with Tom Martinelli, Nov. 8, 2001.
[86] Interview with Tom Martinelli, Dec. 6, 2001.
[87] Recycling Economics Group. 1995. Rest Area Recycling Effectiveness Study, p. 25.
[88] Interview with Tom Martinelli, Nov. 8, 2001.

- Especially where contamination is high, crews are reluctant to sort out the mess. Recycling with large amounts of contaminants attracts pests, such as rodents. In the summer, bees also posed a problem for the workers.[89] However, it is important to note that similar problems can pose a problem for trash collection.

- RFW also experienced some difficulties with the different WDOT districts, which occasionally responded to maintenance crew complaints by removing recycling receptacles.[90]

Despite these problems, the Wisconsin Rest Area Maintenance program has been highly successful in diverting waste from landfills. Both diversion and total recovery rates for rest areas have steadily increased. Between 1992 and 1995, the diversion rate increased from 15.6% to an impressive 29.3%, indicating that the program is highly effective.[91] The recovery rate for waysides jumped dramatically from 42% in 1994 to 80% in 1995.[92] In 1998, CRPs and CHDs reported recycling 41,490 lbs of aluminum, 50,120 lbs of plastic, 156,717 lbs of glass, and 32,922 lbs of newspaper and magazines.[93] Periodic surveys also show an increase in the number of visitors using the recycling facilities, from about 42% in 1996 to 52% in 1998.[94] (Please see Appendix F for the total recovery rate and waste diversion rate of Wisconsin rest area recycling program.)

[89] Interview with Dave Kreger, Nov. 30, 2001.
[90] Interview with Dave Kreger, Nov. 30, 2001.
[91] The percentage of recyclables in the waste stream also increased over this time period, from 24% in 1992 to 43.8% in 1995. However, it increased less dramatically as a proportion of total waste (82%) than did the diversion rate (88%). (Recycling Economics Group. 1995. Rest Area Recycling Effectiveness Study, p. 24).
[92] Recycling Economics Group. 1995. Rest Area Recycling Effectiveness Study, p. 2-3.
[93] In addition, 19,119 lbs of tin and 22,243 lbs of cardboard were collected.
[94] Rehabilitation for Wisconsin, 1998 Rest Area and Wayside Recyclable Materials Report.

In terms of operations, WDOT thinks that the program has been highly successful. The CRPs and CHDs have had to do less sorting over time, indicating an increase in public sensitivity to recycling.[95] Moreover, the public seems to be pleased with the program.[96] RFW periodically surveys rest area users about the recycling program and overall rest area maintenance. Rest areas also have suggestion boxes. Responses from both of these methods have been very positive, giving Wisconsin rest facilities a high rating on both recycling efforts and on cleanliness.[97] For example, one survey response reads, "Your recycle area is great. You may want to take pictures of the line up and send them to other states—A+."[98]

The service to rest areas improved significantly when the sheltered workshop employees took over rest area maintenance from county highway departments. Moreover, there is substantial public benefit from providing entry-level jobs to a historically disadvantaged population.[99] The Rest Area Maintenance program provides employment opportunities to over 300 individuals with disabilities annually.[100] These individuals benefit from the close supervision offered by the shelter workshops. Many of workshop employees are highly satisfied with their jobs and have remained in their positions for a number of years. Others use the opportunity to learn valuable work skills, increasing their overall employability. The waiting lists that occasionally arise for RAM positions attest to the popularity of the program.[101]

[95] Interview with Tom Martinelli, Nov. 8, 2001.
[96] Disabled Workers Pick Up Waysides, Wisconsin State Journal, Mar. 22, 1995, p. 8B.
[97] See <http://www.rfw.org/ram-program.html>. Accessed Oct. 11, 2001.
[98] Rehabilitation for Wisconsin, 1998 Rest Area and Wayside Recyclable Materials Report.
[99] Disabled Workers Pick Up Waysides, Wisconsin State Journal, Mar. 22, 1995, p. 8B.
[100] See <http://www.rfw.org/ram-program.html>. Accessed Oct. 11, 2001.
[101] Interview with Dave Kreger, Nov. 30, 2001.

Table 1. Key Findings from State Rest Area Recycling Programs

State	California	Ohio	Wisconsin
Legal Background	Assembly Bill 75	Recycling Law	Act 335 1990
History	-State initiated in 1993 -Varied from Districts -D1 and D2 around 1998	-Pilot program in 1994-1995 -Reinstated in 2000 -Currently "on hold"	-Pilot program in 1992 -State-wide by 1995
Rest area information	-88 in CA (7 in D1 and 19 in D2) -Northern CA Rural area	-Rural area	-Central and Southern WI -outside of populated areas
Mechanism	-Sheltered Workshop (SW)	-Districts volunteered sites -Local non-profit recycling center pick up	-Non-profit Rehabilitation for Wisconsin (NRW) -RFW contracts out to community SW
Special Program Design		-Signage on highway and entrance of rest area	-Semi-circle layout of recycling containers
Recycled materials	Plastics, glass, aluminum cans, some paper, cardboard, green wastes	Aluminum/bimetal beverage cans, plastic bottles, glass, newspaper	Aluminum, tin, clear plastic containers, glass, newspaper
Data collection	-Contractors required to report -Still a work in process -No complete data yet	-Estimates from custodial staff -Survey cards	-Recycling materials reports from 1993 to 1999 -Public surveys -Trash sort studies
Educational efforts	-CA education on recycling -Brochures, leaflets -Community presentation, school assemblies	-Leaflets -Decals -Signage -Surveys -Events	-Press releases -Brochures -Radio broadcasts -Signage
Funding	-Funded by District Caltran -Purchase of receptacles -Payment to SW	-ODOT provides grants -No cost to ODOT beyond purchase of containers and trash bags -Current budget cutbacks	-DOT budget ($5.5 million budget 2001 for rest area maintenance)
Success	-People start to recycle -Employment for disabled -Proceeds from recycling	-Good signage	- Increased Waste diversion and recovery rate -Increased public sensitivity -Substantial public benefit
Difficulties	-Procedure for data collection -Vandalism and theft -Resistance to recycling	-Lack of funding to continue -Lack of data/records	-Contamination at beginning -Broken glass -Hard to find market for recycled materials -Scavenging -Illegal dumpling -Reluctant crews

Other Surveyed States

Illinois

Illinois Department of Transportation (ILDOT) began its rest area recycling program six years ago, after a three-year pilot program at several locations. Thinking that it is "the responsible thing to do," ILDOT implemented a recycling program targeted at rest areas because of the potentially large quantities of recyclable solid waste discarded there.[102] The program provides aluminum recycling at all 30 interstate highway rest areas.[103] The public can also recycle paper,[104] plastic, glass, and other metal containers at select sites. Public cooperation has been very good, although specific information on recovery and diversion rates is not available. Contamination in recycling receptacles has been minimal, perhaps due to the signs letting the public know where to dispose of recyclable containers.[105] The success of this and other programs, such as regular evaluations of litter levels and rest area maintenance, have led to Illinois' rest areas being rated some of the cleanest in the country.[106]

ILDOT contracts operations to 45 shelter workshops, which provide employment for the mentally and physically handicapped. ILDOT allows the shelter workshops to keep the cans as extra revenue. The program is funded by ILDOT.[107]

[102] Survey completed by Carole Prudent for Rich Nowack of ILDOT, Nov. 15, 2001.
[103] Some rest areas are double-sided, for a total of 53 sites (Interview with Rich Nowack of ILDOT, Oct. 27, 2001).
[104] Interview with Rich Nowack of ILDOT, Oct. 26, 2001.
[105] Survey completed by Carole Prudent for Rich Nowack of ILDOT, Nov. 15, 2001.
[106] Interview with Rich Nowack of ILDOT, Oct. 26, 2001.
[107] Interview with Rich Nowack of ILDOT, Oct. 26, 2001.

Indiana

Indiana's Greening the Government Program mandated the establishment of recycling efforts at all state facilities.[108] The public is not, however, required to recycle in most Solid Waste Management Districts.[109] Recycling has been intermittently available at rest areas throughout the state for the past two years.[110] Receptacles at these rest areas are not standardized.

Although recycling has been established only intermittently, the Indiana Department of Transportation (INDOT) is planning a statewide program that will encompass all locations. To supplement ongoing educational efforts,[111] this program will include new components, such as a recycling mascot,[112] a posted mission statement, and signs for recycling receptacles.[113] In addition to educating the public about recycling, INDOT hopes to achieve reductions in waste and litter as a result of the planned rest area recycling program.

Plans to expand the program have been stalled, and will likely remain on hold for the next two years, due to a hiring freeze and budget cuts. Because of the lack of directed funds, INDOT has had to utilize environmental budget dollars and work with solid waste management districts to support recycling at state facilities.

---

[108] U.S. State and Local Governments with Sustainability Programs, Commonwealth of Massachusetts State Sustainability Program, Jul. 2001.
[109] Some localities have given residents a strong incentive to recycle with pay-as-you-throw programs.
[110] Survey completed by Matt Frazer of INDOT, Nov. 26, 2001.
[111] Matt Frazer has been utilizing the monthly INDOT newsletter to recognize outstanding recycling efforts by department employees. In addition, prizes made of recycled materials are awarded to winners of the Recycling Trivia Question program.
[112]The mascot's name was originally going to be Roady the Recycler. However, since the initial interview, Matt Frazer has indicated that the mascot is undergoing changes.
[113] Interview with Matt Frazer of INDOT, Oct. 26, 2001.

Oregon

The Oregon Department of Transportation (ODOT) has recycling programs for scrap signs, metal, and vegetation. The target audience is agency employees.

Despite all of its attention to environmental issues, ODOT does not have a rest area recycling program. Oregon State Park and Recreation has recycling in state Parks located along or near state highways. Taking the Park and Recreation Department's lead, ODOT evaluated implementing a recycling program at rest areas in the mid 1990s. However, a recycling program was not implemented because of the high costs, the remoteness of rest areas, the lack of recycling markets for haulers, and ODOT's inability to 'police' rest areas and ensure that recycling materials have been properly sorted.[114]

Texas

Texas, a state that has shown its commitment to recycling by making it mandatory for government agencies, has a unique rest area recycling program. [115] The R.E.S.T. program, or the Recycled Educational Stop of Texas, "soft" opened in 1996 at the Colorado County rest area on Interstate 10 between Houston and San Antonio.[116] In addition to providing recycling services for aluminum cans,[117] the Texas Department of Transportation (TxDOT) showcases the use of recycled materials in construction. The public can touch and use products made from recycled materials, such as plastic benches.[118] To achieve its principal goal of increasing public

[114] Interview with Susan A. Chase, Oregon DOT, Oct. 29, 2001.
[115] See Texas State Code, Chapter 361.
[116] Interview with Rebecca Davio of TxDOT, Oct. 19, 2001.
[117] Data on aluminum can recycling is not available, because this component of the R.E.S.T. program commenced only recently.
[118] The rest area also features walkway pavers made from scrap tires, sidewalks from fly ash, building framing from recycled steel, siding and window frames from recycled aluminum, and a service road from reused hot mix (See <http://www.dot.state.tx.us/insdtdot/orgchart/gsd/recycle/vtour/StartTour.htm>.).

awareness, signs stress the importance of recycling aluminum cans and of buying recycled products.[119] The program doesn't limit itself to educating the tens of thousands of visitors to the Colorado County rest area; it also provides an online virtual tour that discusses the importance of choosing products made of recycled materials.[120] Public response to the program has been positive.

The R.E.S.T. program was partially funded by a pollution-prevention grant from the EPA. The expense of collecting recycled cans comes out of TxDOT's budget for normal rest stop operations.[121]

[119] Survey completed by Rebecca Davio of TxDOT, Nov. 14, 2001.
[120] See <http://www.dot.state.tx.us/insdtdot/orgchart/gsd/recycle/vtour/StartTour.htm>.
[121] Survey completed by Rebecca Davio of TxDOT, Nov. 14, 2001.

Recycling Programs: Other Types of Public Space

Public space recycling has become more and more widespread, especially in recent years. Recycling in metropolitan areas and subways has taken off in cities like Chicago and New York.[122] Parks across the nation—for example, Acadia, Olympic, Grand Canyon, and Rocky Mountain National Parks, as well as many state and local parks—have implemented public space recycling programs. Communities in Massachusetts are doing likewise at beaches, playing fields, and parks.[123] Examining recycling programs in other venues has brought to light some interesting similarities and contrasts with rest area recycling. Although recycling programs in other types of public spaces necessarily have important design differences, the comparison is worthwhile because so few data are available on rest area recycling. Moreover, many of the lessons learned in other contexts can be adapted and applied when designing a program for rest areas.

Recycling Collection

Methods of collection are likely to differ substantially across different public spaces. Rest areas are widely distributed across the state, but receptacles are in close proximity of each other within a rest area. In contrast, a recycling program in a metropolitan area, for example, is likely to have receptacles that are spread out within a small geographic area. Variation in the spatial distribution of receptacles means that collection will differ across different types of public spaces. Nevertheless, the comparison is worthwhile because so few data are available on rest area recycling.

A central question for a public space recycling program is, who will collect the recyclables? Some programs look to local business. The New York Department of Sanitation (NYDOS) asks commercial organizations to collect recyclables on or near their place of business. These businesses can highlight their recycling efforts to improve their public image. In exchange for the

[122] See <http://www.cityofchicago.org/Environment/SolidWaste/RecyclingInitiative.html>.
[123] Capone, Lisa. Recycling Expands to Public Spaces. The Boston Globe, Sunday, Jul. 22, 2001. p. 2.

public relations benefits, businesses agree to maintain and empty bins on a regular basis. Participating businesses place blue and green bins with a corporate name and logo in public spaces with a lot of foot traffic.[124]

Our research showed that a number of state programs had problems with scavenging, particularly aluminum. The price of aluminum has ranged from about $.20 to $.30 per pound in recent years.[125] The poor (and possibly other groups) would take the aluminum from recycling receptacles and sell it on the market. Wisconsin dealt with this problem by putting locks on aluminum receptacles. However, other open space recycling programs have tried a different approach, which could also be successful in the rest area context. In New York City, the Times Square Deposit Bank program included scavenging as an integral part of its operations. With the slogan "everyone deposits, everyone redeems," this trail program captured about 70% of bottles and cans thrown out in Times Square.[126] The redemption law in New York probably helped this program to successfully capture not only high-priced aluminum but also other materials such as glass and plastic containers.

Rockport, Massachusetts has followed a similar strategy with its Adopt-a-Recycling-Spot program. Under this program, people who empty recycling bins are allowed to keep the deposit on returnable bottles and cans.[127]

[124] New York Department of Sanitation, How a Few Old Newspapers and Some Empty Soda Cans Can Improve Your Public Image. p.2.
[125] Interview with Tom Martinelli, Nov. 8, 2001.
[126] See <http://www.greenmap.org/mwd/consulting/timessquare.html>.
[127] Capone, Lisa. Recycling Expands to Public Spaces. The Boston Globe, Sunday, Jul. 22, 2001. p. 2.

Layout and Design of Receptacles and Signs

The variety of designs for recycling receptacles and signs probably does not mean that some designs are more appropriate for certain situations than others. On the contrary, consistency in design and layout will likely increase the public's ability to distinguish recycling containers from trash cans. It may also increase people's awareness of the availability of recycling services. Therefore, recommendations that arose from different public space recycling programs are highly applicable to the rest area context.

Placement of recycling receptacles can have a large impact on the diversion and contamination rates. Placing containers in locations were large quantities of recyclables are usually thrown out, such as near picnic areas, will lead to higher recycling rates.[128] Agencies that operate recycling programs in other types of public spaces stress the importance of placing recycling containers near or next to existing trash receptacles.[129]

Signage is crucial for reducing the risk that people will mistake recycling receptacles for trash cans. As mentioned in the case study of Wisconsin, making signs clearer in the second year of the program seemed to lead to lower levels of contamination. NYDOS likewise reports that clear signage helps to reduce contamination rates. From its experience with recycling in public metropolitan areas, NYDOS recommends that all sides of the containers be clearly labeled. NYDOS also suggests using easily readable, blue and green decals or paint on recycling bins.

[128] New York Department of Sanitation, How a Few Old Newspapers and Some Empty Soda Cans Can Improve Your Public Image. p.4.
[129] New York Department of Sanitation, How a Few Old Newspapers and Some Empty Soda Cans Can Improve Your Public Image. p.4; Recycling Advocates, p. 11.

Blue and green receptacles are recommended, because these are the officially designated colors of New York's recycling program.[130]

Lessons from recycling at public events emphasize the use of signage to increase participation. Recycling Advocates advise using banners at building entrances and signs on both garbage and recycling containers. To promote recycling, recycling locations should be highly visible, and signs should be placed at eye level.[131]

The type of container will also have an impact on contamination levels. Containers with holes in the lids just large enough to fit the desired type of material (holes for bottles and cans, slots for newspaper and magazines) will have less contamination than non-specialized containers. NYDOS further recommends that receptacles be maintained regularly, because unsightly ones will attract contamination.[132]

[130] New York Department of Sanitation, How a Few Old Newspapers and Some Empty Soda Cans Can Improve Your Public Image. p.4.
[131] Recycling Advocates, Recycling at Events: A Guide to Reducing Waste at Any Event. p.7-12.
[132] New York Department of Sanitation, How a Few Old Newspapers and Some Empty Soda Cans Can Improve Your Public Image. p.4.

Recommendations

The following recommendations were arrived at after completing our case studies and comparing the experiences detailed in each. These recommendations are based largely on a comparison of program outcomes as judged by the various transportation and environmental managers we interviewed. The criteria used to reach our conclusions on what constitutes a successful rest area recycling program include: environmental sustainability, public awareness, and program feasibility (including cost and effectiveness- neither of which we were able to collect sufficient data on to produce a separate section of analysis).

Should Massachusetts develop a rest area recycling program?

Based on our analysis of other state rest area recycling programs, and taking into account of the situation in Massachusetts, we recommend that Massachusetts consider developing a rest area recycling program. Below are the reasons for Massachusetts to do so.

- **Massachusetts has a solid waster master plan.** The state has always been proactive in waste reduction and recycling. The recently released solid waste master plan has set a 70% percent waste reduction target by 2010. To achieve waste reduction goal, Massachusetts must try all efforts to encourage recycling. There are 108 rest areas along highway in Massachusetts, and there would be great potential for recycling. Rest area recycling program could help the state to achieve waste reduction goal.

- **MassHighway has a strong commitment to recycling.** Many state agencies have a strong commitment to recycling, especially MassHighway. MassHighway recycled 76 percent of its waste stream in 2000, more than 15,000 tons. MassHighway has already implemented Facility Recycling Program and Adopt-A-Visibility Site (rest area) Program. Right now, not much effort has been made in rest area recycling, and it could be an area to show MassHighway's recycling commitment.

- **Recycling infrastructure in Massachusetts is already in place and advanced.**

- **Rest area recycling program could be used for promoting recycling in other public spaces**.

However, as we see from other state rest area recycling programs, there might be some barriers to this program. The major barriers experienced in other states are contamination in the receptacles caused by mixture of recyclables with wastes and illegal dumpling, people's resistance to change their behavior to recycle, vandalism and theft of receptacles, scavenging of recyclables, difficulties in data collection, lack of funding to sustain the program, etc. With careful design and educational efforts, some of the barriers could be minimized.

How could Massachusetts set up the program?

Pilot Program

Before launching a statewide program, Massachusetts should initiate a pilot rest area recycling program. The aim of the pilot program is to evaluate the feasibility and sustainability of a rest area recycling program in Massachusetts. A pilot would help to work out procedural issues particular to this state. Since Massachusetts' 108 rest areas vary with respect to distance from recycling distributors, size, and traffic, the recycling program might need to be adjusted for each. Keeping the number of sites to a minimum until the program is running smoothly would reduce administrative demands.

Administrative demands may be significant, especially at first. For example, Rehabilitation for Wisconsin found that administering the rest area maintenance program proved challenging in the first year, specifically because of the need to coordinate many CRPs and to ensure that data collection requirements were met. However, the programs have generally not posed significant administrative difficulties after an initial implementation phase. A pilot program would allow Massachusetts to gain experience with and develop procedures that can be applied to other rest areas, thereby promoting a smooth transition to the statewide program.

In terms of pilot site selection, we recommend choosing rest areas along heavily traveled routes. According to the case studies, recycling at rest areas along Interstates posed fewer problems for program administrators. Rest areas in remote areas in California were frequently vandalized. In Wisconsin, the contamination rate was lower for rest areas along the Interstates than for waysides. In contrast, large distances between rest areas and/or from maintenance crews and an inability to oversee sorting and collection can make this type of program very difficult to manage. Oregon considered implementing such a program in mid 1990s, but did not do so partially for

these reasons. Initial focus on Interstate rest areas would allow program supporters to demonstrate success and push for program expansion to more challenging sites later on.

Selection of Materials to Be Collected

When selecting the types of materials to be accepted by a rest area recycling program, Massachusetts should consider the types of waste generated by travelers. In Wisconsin, the largest portion of recycled materials (by weight) consisted of glass, plastic, and aluminum, respectively. Newspaper and magazines also accounted for a significant portion of recycled materials.[133] Ohio's program collected aluminum/Bi-metal beverage cans, plastic beverage bottles, glass containers (in 5 of 6 locations) and newspaper (in two locations), because it seemed most likely that travelers would have them in their cars.

The types of materials collected should also reflect the design of the program. If using waste haulers to pick up the materials, be sure to verify what kinds of materials they are set up to accept. With an *everyone deposits, everyone redeems* design, only materials that have redemption value should be accepted in order to ensure a self-sustaining program. Likewise, a program that allows service providers to keep the proceeds from the sale of recyclables as a part of the contract should focus on materials that receive a significant market price (primarily aluminum, but CRPs have also reported revenues from the sale of plastic bottles even in the absence of a bottle bill). Selecting high-priced materials for collection will provide service providers with incentives to keep the diversion rates high, even when materials need to be sorted.

[133] In 1997, 156,717 lbs. of glass, 50,120 lbs. of plastic, 41,490 lbs. of aluminum, and 32,922 lbs. of newspaper were recycled. The quantities of tin (19,119 lbs.) and cardboard (22,243 lbs.) were less substantial.

Vendor Selection

Massachusetts should choose service provider groups that will minimize costs. Efficiency and cost-effectiveness are important with this kind of program, because costs can be high.[134] If rest area maintenance is already contracted out to the private sector, it would be cost-effective to ask these vendors to incorporate recycling into their maintenance work. Many waste contractors are already set up to accept recycling, so agencies can build recycling services into future waste collection contracts.

Another model involves contracting maintenance to organizations that employ the handicapped or some other disadvantaged group. With the California and Wisconsin programs, sheltered workshops could easily integrate recycling into their normal maintenance tasks. In contrast, the Ohio model is less cost-effective because it relied on multiple organizations to maintain and service the rest areas. The local non-profit recycling centers that pick up the recyclables could not integrate rest area collection into their schedules as easily as an organization handling both trash and recyclables could. Although these centers did not directly charge the state for their services, the inefficiency of the program caused problems when grant money for the recycling centers dried up.

Another reason for contracting with organizations that employ disadvantaged workers is the tangible benefits to the public. This type of program achieves public value on two fronts: by diverting waste from landfills, and by providing on the job training to a disadvantaged population. As a result, this model can draw support from a range of political interests within the

[134] The need to re-sort materials can incur potentially high labor costs. In addition, costs incurred at start up, such as for recycling receptacles, signs, scales, and other equipment, can be expensive. Moreover, the receptacles may need to be replaced due to normal wear and tear or even vandalism, as seen in the California case.

constituency. In fact, the programs in both Wisconsin and Illinois have shown long-term stability, in spite of considerable program costs.

The importance of providing tangible benefits to different subsets of the constituency is illustrated by Ohio's program. Ohio's program has shown little long-term viability. Originally established in 1994, it was terminated in 1995 because of financial considerations. Ohio's program provided immediate and tangible benefits to two groups: environmentalists, and the traveling public.

- Environmentalists are no doubt important policy entrepreneurs for recycling initiatives. However, they comprise only a subset of the voting public. For example, by contracting to non-profit organizations specialized in recycling, Ohio's program did not offer substantial *tangible* value to citizens outside of environmental circles.[135] Without a solid political foundation and facing grant cuts, the decision to continue the program was based primarily on a cost analysis. In Ohio's case, it is not surprising that the somewhat abstract costs of solid waste disposal won out over the immediate costs of sustaining a recycling program.

- Rest area recycling programs are most visible to the traveling public (the clients of the program), a large portion of whom is residents of other states. Therefore, the clients of a rest area recycling program are often not state residents, who can vote to support these initiatives. Local public support for a program that lacks visibility and relevance to the

[135] Other benefits from recycling tend to be abstract, such as the value of diverting waste from landfills in terms of reduced pollution and better environmental health. Public awareness also has substantive value, especially insofar as it promotes general environmental consciousness. On the other hand, solid waste disposal incurs more abstract costs. In the short run, it is probably easier to ignore the cost of not recycling—such as the loss of landfill space, increased pollution and environmental degradation, and natural resource depletion (if fewer goods are produced from recycled

community may not materialize.[136] As a result, the continuity of this type of program is highly dependent on its overseers. In times of abundant budget cuts, costly rest area recycling programs may take a back seat to more 'pressing' needs. Thus, the political sustainability of Ohio's rest area recycling program was compromised.

Because it is true of all rest area recycling programs that the benefits are most visible to the traveling public, it is important to structure the program in a way that local residents are aware of the benefits. It is likewise important to construct a program that will have widespread backing. Providing visible benefits to multiple populations and political interests, such as the disabled or disadvantaged youth, in addition to environmentalists, will help to ensure the long term sustainability of the program.

How should Massachusetts design the program?

We also have several recommendations in terms of program design to overcome the possible barriers that the program might meet.

Recommendation 1:Clear and proper signage along highway and at rest areas would greatly improve public awareness and reduce contamination.

---

materials as a result of the recycled materials not being collected). The most tangible expense due to solid waste disposal, hauling costs, is higher if we choose to recycle.

[136] Although the rest area recycling program was re-introduced in 2000 for Ohio's Bicentennial, it has since been put on hold. The fact that the program was promptly revoked after the celebration—which was publicized not only to Ohio residents, but also to non-residents, possibly to attract tourists—seems to further support the idea that its program lacked local support and thus lacked political sustainability.

- Signs should be placed near the marker that alerts drivers that a rest area is ahead. These signs should make drivers aware that the upcoming rest area offers recycling bins. A sign as simple as a recycling symbol followed by the words rest area recycling is adequate. Signs should also be placed throughout the rest area itself. To really draw visitors, the usage of celebrity images on signs is an attractive, but perhaps more costly, option. Signs either over or on the bins should signify what material can be placed there. Signs should also be stationed near any recycled objects at the rest area explaining to visitors how the object was created.

Recommendation 2:Signage and design of receptacle will attract attention and reduce contamination.

One of the most significant issues for recycling programs in rest areas, as well as in other public spaces, is contamination. Contamination has posed a significant problem for all three programs researched. In both California and Wisconsin, employees must go through the labor-intensive process of removing contaminants and resorting materials placed in the wrong bins. WDOT ceased recycling collection at remote or low-traffic rest areas because of the high levels of contaminants. Because contamination can cause significant problems, it is vital that the public be able to easily distinguish recycling barrels from trash bins. Signage and receptacle design are effective ways of encouraging the public to properly sort their waste.

Responses to the survey and case study research also point to the importance of signage for increasing the amount of recyclables that get diverted from regular trash. To our knowledge, the

effectiveness of improving signage to increase the recycling recovery rate has not been statistically proven. However, long term increases in Wisconsin's rest area recycling recovery rates may reflect gradual increases in awareness by the traveling public, which could in part be attributed to improved signage.[137] Recycling coordinators have several recommendations for effective signage:

- Recycling receptacles should be identified by proper signage. Signs located at the recycling barrels should be eye level to increase visibility.[138] In addition, signs can be placed in other areas to increase public awareness of the program. Ohio placed a recycling symbol on highway signs indicating a rest area ahead.[139] Posters in the lobby of main buildings or banners at entryways can boost participation by increasing awareness and educating the public on the importance of recycling.[140] Both California and Wisconsin placed signs facing the parking area to enhance visibility.
- Be specific about what kinds of materials are accepted. Wisconsin had problems with people throwing all types of plastic into recycling bins that accept only types 1 and 2. Three-dimensional signs showing containers in the condition desired by the recycling program (without caps or labels, etc.) or non-abstract diagrams can help to reduce contamination.

[137] Although the 1993 study by the Recycling Economics Group did not substantiate the effectiveness of improved signage to increase the recycling recovery rate, there were several potential reasons for this. First, the DOT did not change signage to significantly increase its ability to attract public attention. In a previous report, the Recycling Economics Group recommended the use of celebrities, but this recommendation was not followed. Second, the sample size was too small to overcome high variation between sites. This could pose difficulties for the study if local residents used the control sites as recycling drop off centers, a strong possibility considering the prevalence of illegal trash dumping (Recycling Economics Group. 1993. Rest Area Recycling Effectiveness Study II, p. 15).
[138] Recycling Advocates, Recycling at Events: A Guide to Reducing Waste at Any Event. p.12.
[139] Interview with Patricia Raynack, Oct. 18, 2001.
[140] Recycling Economics Group. 1992. Rest Area Recycling Effectiveness Study, p. 31; Recycling Advocates, Recycling at Events: A Guide to Reducing Waste at Any Event. p.7.

- Clearly label all sides of both trash and recycling containers, including the top.[141]
- Choose receptacle and/or sign colors consistent with popular practice in local recycling programs to increase recognizability. Both Chicago's streetside recycling and Wisconsin's rest area recycling programs use recycling barrels capped with blue tops and labeled with blue decals.[142] Consistent with the City's recycling program, the New York Department of Sanitation recommends using blue or green receptacles in public spaces.[143] Since the Massachusetts Department of Environmental Protection provides blue recycling bins for curbside pick up programs, recycling receptacles in this color might maximize recognizability and therefore lead to high recovery rates. In addition, many out-of-state travelers will recognize blue containers because of the prevalence of this color in recycling programs in across the country. (Please see Appendix F)

Recommendation 3:Placement and layout of the receptacles will help to enhance recovery rate and reduce contamination.

Experiences from both rest area case studies and recycling programs in other types of public spaces highlight the importance of the location of recycling containers relative to trash cans.

- Placing receptacles where people tend to throw out most recyclables will probably increase the recovery rate.

[141] Recycling Economics Group. 1992. Rest Area Recycling Effectiveness Study, p. 31; New York Department of Sanitation, How a Few Old Newspapers and Some Empty Soda Cans Can Improve Your Public Image. p.4.
[142] See <http://www.cityofchicago.org/Environment/SolidWaste/PublicWayRecycling.html>; Recycling Economics Group. 1992. Rest Area Recycling Effectiveness Study, p. 22.
[143] New York Department of Sanitation, How a Few Old Newspapers and Some Empty Soda Cans Can Improve Your Public Image. p.4.

- In addition, recycling receptacles should always be placed near trash containers for two reasons. First, people will be less likely to throw non-recyclables into recycling containers if a trash can is just as accessible. Second, people who would have thrown all of their waste in the trash may give pause when they see recycling receptacles and decide to sort their trash, thereby increasing the diversion rate.[144]

- While it is vital that recycling containers be placed near trash cans, it is preferable to distinguish the two types of receptacles with their layout to help prevent contamination. In its study of Wisconsin rest areas' recycling effectiveness, the Recycling Economics Group found that placing recycling barrels in a semi-circle behind the trash can reduces contamination over placing all containers in a strait line parallel to the sidewalk.[145] (Please see Appendix F)

Recommendation 4:Extensive educational campaign would lead to a successful program.

Making the traveling public aware of the importance of recycling is vital to the success of any rest area program. People must be made familiar with how they can help clean up the environment, as well as how recycled materials can be used to create other products. To do this, an extensive educational campaign should be launched. Besides sinage, flyers, leaflets, brochures, recycled objects and promotional advertising are just a few of the helpful strategies that can be adopted.

[144] Recycling Advocates, Recycling at Events: A Guide to Reducing Waste at Any Event. p.11.
[145] However, the small sample size (two rest areas in the treatment group and another two in the control) does not allow this conclusion to be made with any statistical confidence (Recycling Economics Group. 1993. Rest Area Recycling Effectiveness Study II, p. 14).

- Recycled Objects: To increase awareness and educate the public about recycling how its impacts, rest areas should include objects such as park benches and picnic tables that have been produced from recycled materials. Signs should be posted near these objects to explain them to visitors. For example, Wisconsin, Ohio, and Texas have all highlighted the use of recycled materials in their rest areas.
- Promotional Advertising: To get the word out as far and wide as possible, advertising may be necessary. The state could create radio commercials describing the recycling program. Radio would be a good way to alert out of state travelers to Massachusetts' recycling activities. In addition, brochures, stickers, bumper stickers, pins, pens, and so on could be made from recycled materials, labeled with recycling slogans, and distributed at state events to increase awareness of the program. These items could also be made available at rest area visitor centers.
- Literature: Flyers, leaflets and/or brochures should be made available at all rest area visitor centers. This literature should include information about the goals of rest area recycling to encourage participation in the program. Any brochure should also point out how to correctly sort materials into the various available containers so as to avoid high levels of contamination. For an example see copies of flyers from Wisconsin in Appendix D.

Recommendation 5:Three approaches of data collection could be used to keep track of the program.

It is important to collect data in order to keep track of and evaluate the program's design.

Reporting the recycling progress being achieved can also help raise public awareness of recycling, encourage participation in recycling efforts and promote buy recycled campaigns. Three approaches for data collection used by Wisconsin and Ohio have proved useful and are therefore recommended for Massachusetts.

The first and most direct approach is to ask the contractors to record the weight of each bag of recycling materials and report on this periodically. This approach is used in Wisconsin and District 2 of California. It is recommended that the obligation to report recycling data be written into the contract. Also, follow-up might be needed at the beginning to make sure that the contractors do not forget to keep records and report regularly. It may be difficult at the beginning of the program to get the data back on time, and the data might be crude and incomplete. This is currently happening in District 2 of California, where they just started reporting in 1998. Wisconsin also had such difficulty in the beginning years of its program (1991-1993). However, as time passed, data reporting improved. Ohio has a roadway maintenance index, in which there are records of the estimated amounts of recyclables collected at rest areas. ODOT asked contractors to record the number of bags and containers sent to recycling centers and prepare the reports. Both Wisconsin and Ohio keep good records of recycled materials.

Another approach to collecting information about the recycling program is to conduct visitor surveys. Both Ohio and Wisconsin give surveys to visitors, asking whether they use the recycling containers, whether they noticed the signs, and their opinion about the program. The data obtained is useful to determine the effect of the program, get ideas about the program design, and indicate where there is room for improvement. This could also be used to raise public awareness

of recycling. For example, surveys could be put together with the education literature and made available to the public at the rest areas.

Waste characterization studies, which document the types of materials in the waste flow, are also helpful. Knowing what is being discarded in both trash and recycling receptacles can help recycling coordinators to determine if the recycling program is targeting the most valuable or most abundant materials efficiently and effectively. The Recycling Economics Group conducted several such studies for WDOT. These studies could be performed infrequently and still provide substantial benefit to the sponsor agency.

References

Capone, Lisa. 2001. Recycling Expands to Public Spaces. The Boston Globe, Sunday, Jul. 22. p. 2.

City of Chicago, Department of Environment. Recycling Bins on Streets and in CTA Stations. See <http://www.cityofchicago.org/Environment/SolidWaste/ PublicWayRecycling.html>. Accessed Dec. 1, 2001.

Commonwealth of Massachusetts State Sustainability Program. Jul. 2001. U.S. State and Local Governments with Sustainability Programs.

Gribble, Roger A. 1995. Disabled Workers Pick Up Waysides. Wisconsin State Journal, Mar. 22, p. 8B.

Modern World Design. See <http://www.greenmap.org/mwd/consulting/ timessquare.html>. Accessed Nov. 2, 2001.

Moore, Mark. 2000. Creating Public Value. Cambridge, MA: Harvard University Press.

New York Department of Sanitation. How a Few Old Newspapers and Some Empty Soda Cans Can Improve Your Public Image. See <http://www.ci.nyc.ny.us/html/dos/pdf/image.pdf>.

Recycling Advocates. 2001. Recycling at Events: A Guide to Reducing Waste at Any Event. See <www.recyclingadvocates.org>.

Recycling Economics Group. 1992. Highway Rest Area Waste Characterization Study. University of Wisconsin-Madison.

Recycling Economics Group. 1993. Rest Area Recycling Effectiveness Study II. University of Wisconsin-Madison.

Recycling Economics Group. 1994. Highway Rest Area and Wayside Recycling Effectiveness Study III. University of Wisconsin-Madison.

Recycling Economics Group. 1995. Wisconsin's Adopt-A-Highway Program. University of Wisconsin-Madison.

Recycling Economics Group. 1995. Wisconsin Rest Area and Wayside Recycling Effectiveness Study. University of Wisconsin-Madison.

Rehabilitation for Wisconsin. Rest Area Maintenance. <http://www.rfw.org/ram-program.html>. Accessed Oct. 11, 2001.

Rehabilitation for Wisconsin. 1997. Rest Area and Wayside Recyclable Materials Report.

Rehabilitation for Wisconsin. 1998. Rest Area and Wayside Recyclable Materials Report.

Texas Department of Transportation. Website. <http://www.dot.state.tx.us/insdtdot/orgchart/gsd/recycle/vtour/StartTour.htm>. Accessed Oct. 20, 2001.

Texas Statutes and Codes, Health and Safety Code. 361.020. 2000. Chapter 361: Solid Waste Disposal Act. State Solid Waste Plans.

Texas Statutes and Codes, Health and Safety Code. 361.425. 2000. Chapter 361: Solid Waste Disposal Act. Governmental Entity Recycling.

United States Environmental Protection Agency. Planning Environmentally Aware Events. <wysiwyg//149/http://www.epa.gov/epaoswer/non-hw/reduce/grn-mtgs/mtg.htm>. Accessed Oct. 20, 2001.

United States Environmental Protection Agency, Solid Waste and Emergency Response. 1997. Measuring Recycling: A Guide for Local and State Governments. EPA530-R-97-001. See <http://www.epa.gov/epaoswer/non-hw/recycle/recmeas/download.htm>.

Wisconsin Department of Administration, Demographic Services Center. See <http://www.doa.state.wi.us>. Accessed Nov. 30, 2001.

Wisconsin Department of Tourism. See <http://www.travelwisconsin.com>. Accessed Nov. 30, 2001.

Wisconsin Department of Transportation. Rest Areas and Waysides of Wisconsin. See <http://www.dot.state.wi.us>. Accessed Dec. 3, 2001.

Wisconsin Statutes. 16.15. 2000. Chapter 16: Department of Administration. Resource Recovery and Recycling Program.

Wisconsin Statutes. 287.07. Chapter 287: Solid Waste Reduction, Recovery, and Recycling.

Appendices

List of Appendices

Appendix A: Preliminary Survey Questions

Researcher _____ *Respondent Name* _____

Date _____ *Address, Phone*

_____

Background

- What other recycling programs do you have on the state level? (specify the target population)
- Is recycling mandatory in your state? (specify who is required to recycle)
- Is recycling mandatory in localities near the rest areas?
- Do many of these localities have pay as you throw programs? Are there other incentives to recycle?

Open Space Recycling Program Description

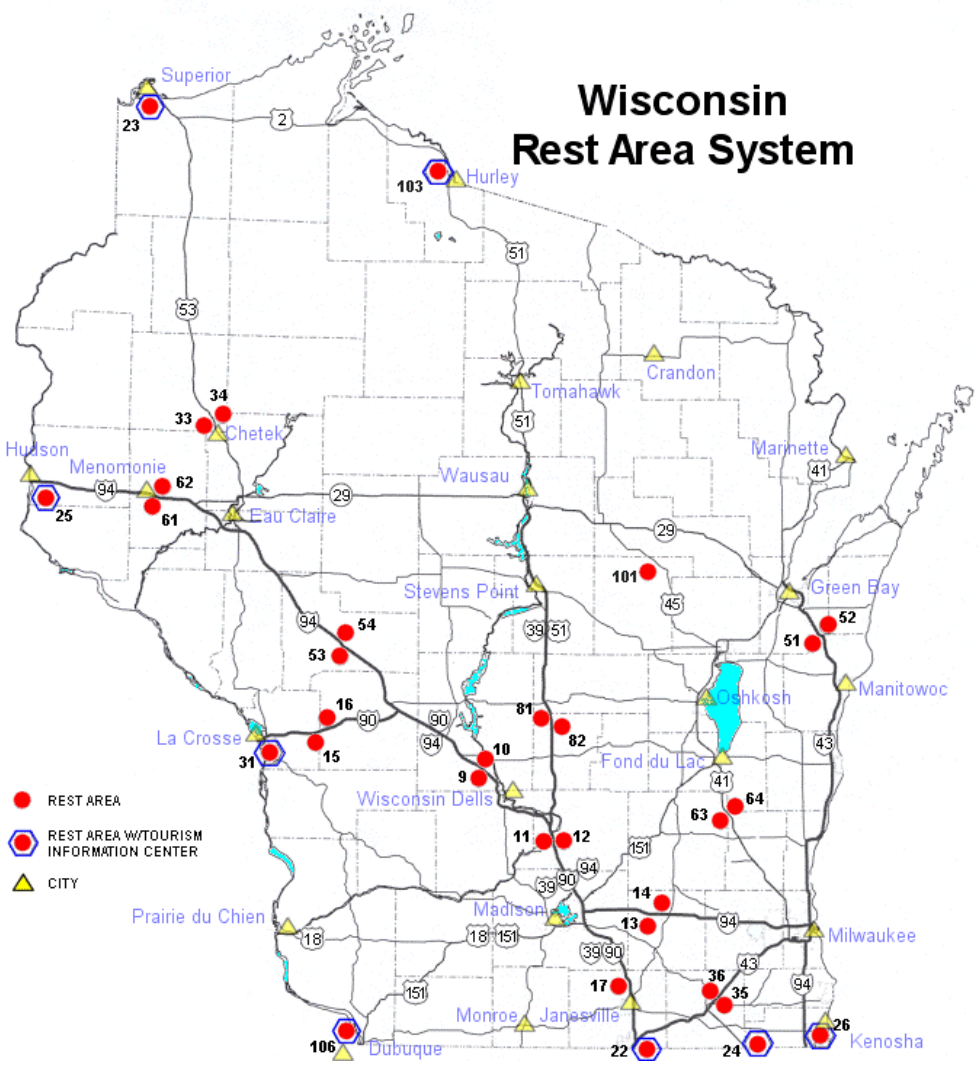
- What types of waste are recycled under the rest area recycling program?
- How long has this program been in effect?
- How is this program funded?
- Was this recycling program modeled after another program? (Please indicate what department/agency implemented the program, whom it targeted, and how it worked)
- Do you have records on waste and recycling collection before and after the beginning of the program? On recycling participation (where participation indicates who is recycling)?
- Is there an education campaign accompanying this recycling program?
- Are there signs to let the public know where to dispose of recyclable containers?

Criteria and Success of Project

- What were your goals in implementing a rest area recycling program (e.g., waste reduction, education and public awareness, reduction of litter)?
- What difficulties did you experience during implementation?
- Do you think the program has been successful? Why or why not? (evaluate in terms of the criteria stated above)

Appendix B: Northern California Rest Area Map

Appendix C: Wisconsin Rest Area Map



Appendix D: Wisconsin Brochure

You are the key

A few travelers don't sort materials carefully. Plastic materials end up in the aluminum bin, and vice versa, and some people toss trash in with materials that could be recycled. When that happens, maintenance workers either have to re-sort the materials, or it all has to be thrown away.

Recycling the right way

The largest problem is in the "plastics" container. Only a few types of plastic are recyclable...generally those with the numbers 1 and 2 in a recycling triangle on the bottom of the container. All other plastics, including plastic wrap, disposable diapers, and styrofoam, should be placed in the trash container.

Save our environment

Please help your recycle team by sorting your materials carefully. When we all pitch in the RIGHT way, our environment is just a little bit better for the effort.

SORTING trash carefully is the key. Please see the guide inside this leaflet for the materials that CAN and CANNOT be recycled.

For further information, please contact the following Department of Transportation agency by writing to:

The Wisconsin Department of Transportation
Division of Highways, Maintenance Section
4802 Sheboygan Avenue
Madison, WI 53705
608 / 266-3745

WISCONSIN DEPARTMENT OF TRANSPORTATION

Printed on Recycled Paper

Recycle Wisconsin

Join Wisconsin's Roadside Recycling Team

We're doing it right!

Guidelines for Wisconsin's Recycling "On the Road" Program

GLASS

☑ YES Bottles and jars ONLY. Remove lids or caps. Separate by color. Paper labels are OK. Place clear glass in the "clear" container; green glass in the "green" glass container, and amber or brown glass in the "brown" glass container.

☐ NO Light bulbs, drinking glasses, medical containers, Pyrex, mirrors, etc.

ALUMINUM

☑ YES Beverage cans (soda or beer) ONLY. Please flatten cans and place them in the container. If they don't flatten readily, they're probably not aluminum.

☐ NO Aluminum/tin foil or bottle caps.

Each recycling container cluster also has a trash receptacle. *Remember the Recycle Rule:* **If In Doubt, Throw It Out.**

TIN

☑ YES Food and beverage cans ONLY. Clean, flatten if possible, and place in recycle container marked "tin."

☐ NO Aerosol cans, paint cans, cardboard-sided juice cans, aluminum beverage cans (soda or beer).

PLASTIC

☑ YES Milk, soda, and detergent bottles are examples of plastics that can be recycled. Remove caps and lids. Look at the bottom of the container. If it has a triangle with numerals ♺ or ♺, it can be recycled. If not, toss it in the trash container. Empty container of all liquids

☐ NO Plastic wrap or bags, styrofoam, clear plastic food containers, hard plastic (toys, pails, etc.), plastic cups, plates, knives, forks and spoons, yogurt or ice cream containers, motor oil containers, antifreeze bottles, or containers labeled with a #3 to #7 within the triangle on the bottom.

Thanks for helping, but...

Please remember that recycling is just one of the environmental "Three R's." If we are to protect our environment, we should give equal or greater attention to Reducing...and Reusing.

Please remember. Wisconsin's environmental future begins with you.

Recycling is right

Wisconsin travelers know recycling is the right thing to do! Since the Department of Transportation put recycling bins in rest areas and wayside, travelers have recycled about 5 tons of materials each month.

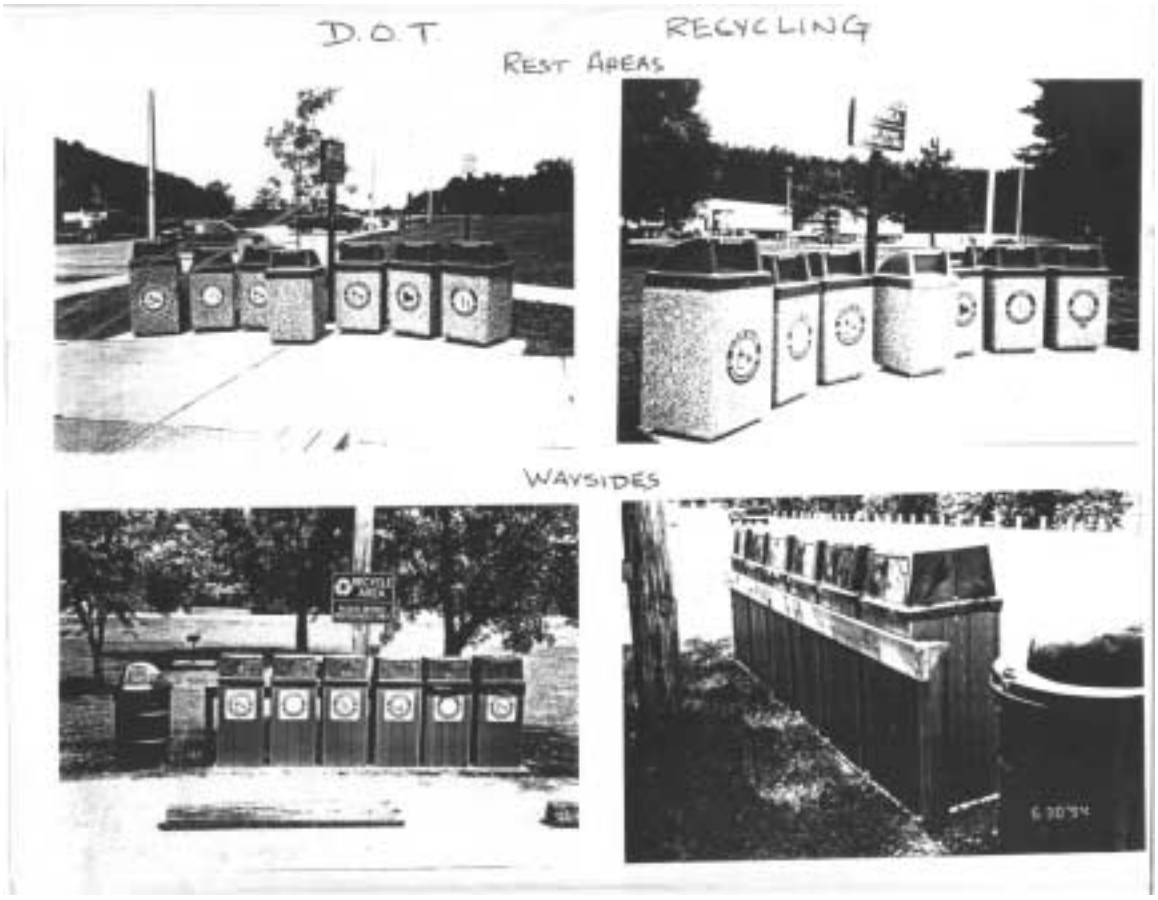
Recycling is easy

It's easy! Clusters of recycling containers and a trash bin are conveniently placed near picnic areas and parking lots.

Join the recycling team

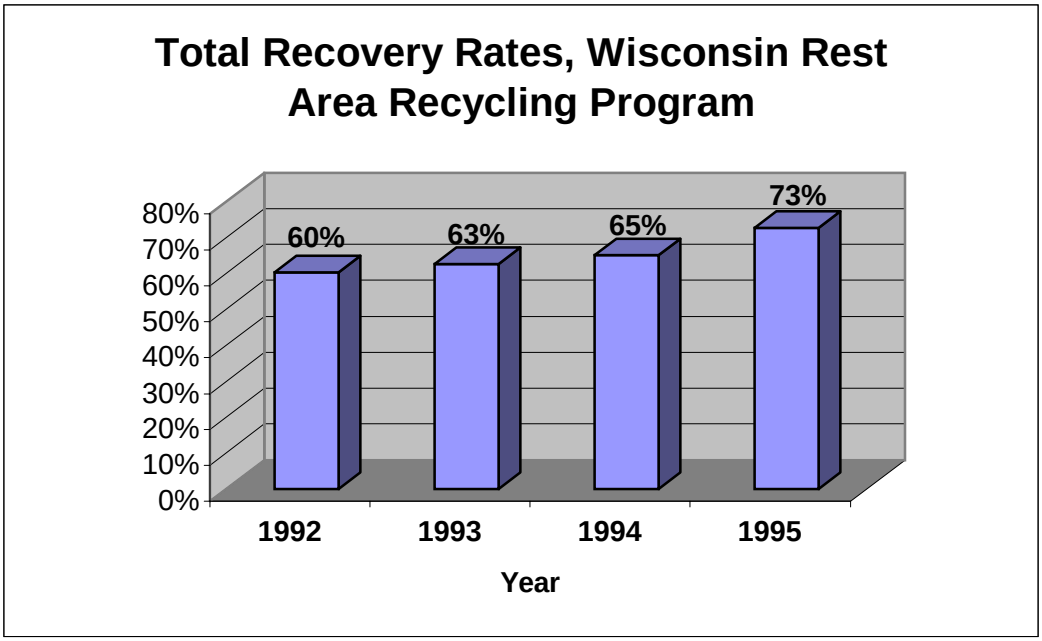
Roadside recycling is a team effort. The Department of Transportation furnishes the recycle containers, travelers sort their trash and deposit recyclable materials in the containers, rest area maintenance workers collect the recyclables and see that it gets to processing centers.

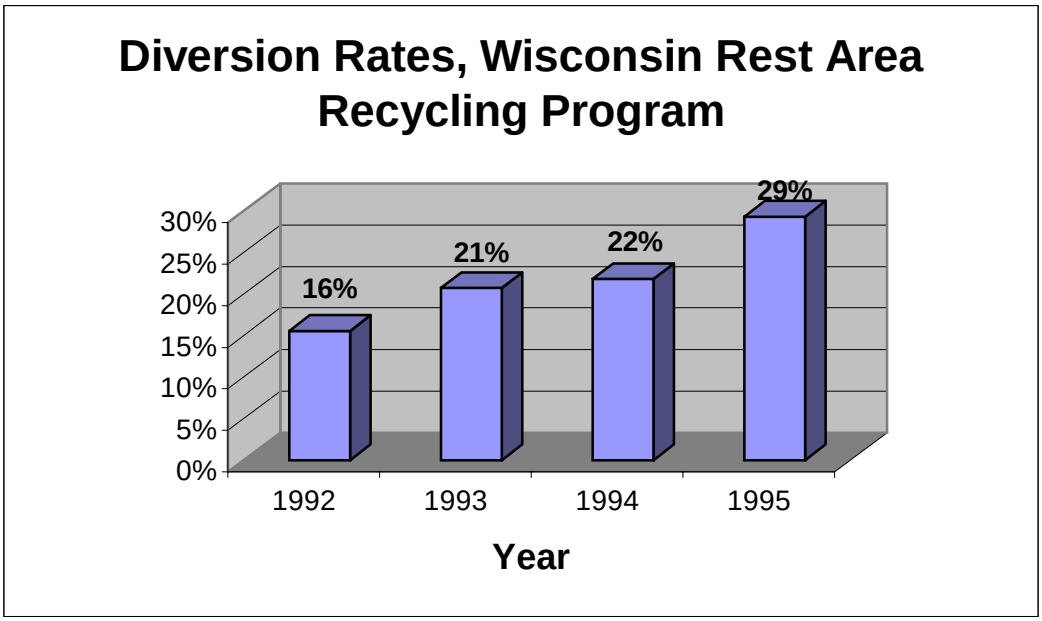
Appendix E: Layout of Recycling Bins in Wisconsin Rest Areas



Appendix F: Receptacle Design in Mauston Rest Area, Wisconsin

Appendix G: Total Recovery Rate and Waste Diversion Rate in Wisconsin Rest Areas





Appendix H: List of Primary Contacts

Name	Title and Agency	Contact Information
Nita Brake	Highway Coordinator District 1 of the California Department of Transportation (Caltrans)	1656 Union St. Eureka, CA Tel: 707-441 5761 E-mail: Nita_Brake@dot.ca.gov
Susan A Chase	Oregon Department of Transportation	Tel: 503-986 3008
Rebecca Davio	Recycling Manager Texas Department of Transportation	125 E 11th St Austin, TX 78701 Tel: 512-416 2086 Email: rdavio@dot.state.tx.us
Matt Frazer	Environment, Planning and Engineering, Indiana Department of Transportation	Tel: 317-233 0582 Email: mfrazer@indot.state.in.us
Rick Houston	Maintenance Manager Office of Roadsides, Caltrans Headquarters	E-mail: Rick_Houston@dot.ca.gov
Barbara Johnson	Recycling Coordinator District 2 of Caltrans	1657 Riverside Dr. Redding, CA Tel: 530-225 3062 E-mail: Barbara_Johnson@dot.ca.gov
Dave Kreger	Director Rehabilitation for Wisconsin	4785 Hayes Rd., Suite 202 Madison, WI 53704 Tel: 608-244.5310
Thomas Martinelli	Winter Maintenance Engineer Bureau of Highway Operations, Wisconsin Department of Operations	4802 Sheboygan Ave., Room 501 P.O. Box 7986 Madison, WI 53707-7986 Tel: 608-266 3745 Email: Thomas.martinelli@dot.state.wi.us
Rich Nowack	Bureau of Operations, Illinois Department of Transportation	Tel: 217-782 2984 Email: nowack@nt.dot.state.il.us
Trevor O'Shaughnessy	AB75 Coordinator Caltrans Headquarter	1001 I St. Sacramento, CA Tel: 916-341 6203
Paul Werth (retired)	Bureau of Highway Operations, Wisconsin Department of Operations	4802 Sheboygan Ave., Room 501 P.O. Box 7986 Madison, WI 53707-7986 Tel: 608-266 3879